What is claimed is:

1. An optical device comprising:

an optically transparent component characterized by a component light transmission variation, the component transmission variation being a function of at least one physical characteristic of the optically transparent component; and

an anti-reflective coating disposed on a first side of the optically transparent component, the anti-reflective coating including at least one layer of material such that the optical device transmission variation is less than the component transmission variation.

2. The optical device of claim 1, wherein the optical device transmission variation is equal to approximately one-sixth the component transmission variation.

3. The optical device of claim 1, wherein the at least one characteristic is birefringence.

4. The optical device of claim 1, wherein the at least one characteristic is refractive index inhomogeneity.

5. The optical device of claim 1, wherein the at least one characteristic is a thickness variation of the optically transparent component.

6. The optical device of claim 1, wherein the at least one layer includes Al2O3.

7. The optical device of claim 1, wherein the at least one layer includes MgF2.

8. The optical device of claim 1, wherein the anti-reflective coating includes a plurality of layers.

9. The optical device of claim 8, wherein the plurality of layers includes at least one

layer comprising Al2O3.

10. The optical device of claim 8, wherein the plurality of layers includes at least one layer comprising MgF2.

11. The optical device of claim 1, wherein the optically transparent component is comprised of a glass material.

12. The optical device of claim 1, wherein the optically transparent component is comprised of silica.

13. The optical device of claim 12, wherein the optically transparent component is comprised of fused silica.

14. The optical device of claim 1, wherein the optically transparent component is comprised of quartz glass.

15. A photolithography system for making at least one semiconductor device, comprising:

an illumination light source adapted to transmit illumination light characterized by a center wavelength;

a projection optical system optically coupled to the illumination light source, the projection optical system being configured to project the illumination light onto the at least one semiconductor device; and

a photomask disposed between the illumination light source and the projection optical system, the photomask including an optically transparent component and a coating disposed on a first side of the optically transparent component, the optically transparent component being characterized by a component transmission variation, the coating including at least one layer of anti-reflective material such that a photomask transmission variation is less than the component

light transmission variation.

16. The system of claim 15, wherein the photomask transmission variation is equal to approximately one-sixth the component transmission variation.

17. The system of claim 15, wherein the center wavelength is less than or equal to 250nm.

18. The system of claim 15, wherein the center wavelength is substantially 248nm.

19. The system of claim 15, wherein the wavelength is substantially 193nm.

20. The system of claim 15, wherein the wavelength is substantially 157nm.

21. The system of claim 15, wherein the at least one layer includes Al_2O_3.

22. The system of claim 15, wherein the at least one layer includes MgF_2.

23. The system of claim 15, wherein the anti-reflective coating includes a plurality of layers.

24. The system of claim 23, wherein the plurality of layers includes at least one layer comprising Al_2O_3.

25. The system of claim 23, wherein the plurality of layers includes at least one layer comprising MgF_2.

26. The system of claim 15, wherein the first side is a light incident side with respect to the illumination light source.

27. The system of claim 26, wherein the device pattern corresponds to an electronic circuit in a semiconductor device.

28. The system of claim 26, wherein the device pattern corresponds to a mechanical micro-structure in a MEMs device.

29. The system of claim 26, wherein the device pattern corresponds to an optical component.

30. A method for making an optical device, the method comprising:

providing an optically transparent component characterized by a component light transmission variation, the component transmission variation being a function of at least one physical characteristic of the optically transparent component; and

disposing a coating on a first side of the optically transparent component, the coating including at least one layer of anti-reflective material such that the optical device transmission variation is less than the component transmission variation.

31. The method of claim 30, wherein the at least one layer includes Al_2O_3.

32. The method of claim 30, wherein the at least one layer includes MgF_2.

33. The method of claim 30, wherein the anti-reflection coating includes a plurality of layers.

34. The method of claim 33, wherein the plurality of layers includes at least one layer comprising Al_2O_3.

35. The method of claim 33, wherein the plurality of layers includes at least one layer

comprising MgF2.

36. The method of claim 30, wherein the optically transparent component is comprised of a glass material.

37. The method of claim 30, wherein the optically transparent component is comprised of silica.

38. The method of claim 37, wherein the optically transparent component is comprised of fused silica.

39. The method of claim 30, wherein the optically transparent component is comprised of quartz glass.

40. method of claim 39, wherein the device pattern corresponds to an electronic circuit.

41. The method of claim 39, wherein the device pattern corresponds to a mechanical micro-structure in a MEMs device.

42. The method of claim 39, wherein the device pattern corresponds to an optical component.

43. A method for making at least one semiconductor device using a photolithography system, the photolithography system including an illumination light source adapted to transmit illumination light characterized by a center wavelength and a projection optical system optically coupled to the illumination light source, the projection optical system being configured to project the illumination light onto the at least one semiconductor device, the method comprising:

disposing a photomask between the illumination light source and the projection optical

system, the photomask including an optically transparent component and a coating disposed on a first side of the optically transparent component, the photomask also including a pattern disposed on a second side of the component opposite the first side, the optically transparent component being characterized by a component transmission variation, the coating including at least one layer of anti-reflective material such that a photomask transmission variation is less than the component transmission variation;

activating the illumination light source being activated to thereby propagate illumination light through the photomask; and

projecting the light propagating through the photomask from the projection optical system onto the at least one semiconductor device, whereby the pattern is transferred onto the semiconductor device.

44. The method of claim 43, wherein the pattern corresponds to an electronic circuit.

45. The method of claim 43, wherein the pattern corresponds to a mechanical micro-structure in a MEMs device.

46. The method of claim 43, wherein the device pattern corresponds to an optical component.

47. The method of claim 43, wherein the at least one layer includes Al2O3.

48. The method of claim 43, wherein the at least one layer includes MgF2.

49. The method of claim 43, wherein the anti-reflection coating includes a plurality of layers.

50. The method of claim 43, wherein the plurality of layers includes at least one layer comprising Al2O3.

51. The method of claim 43, wherein the plurality of layers includes at least one layer comprising MgF2.

52. The method of claim 43, wherein the optically transparent component is comprised of a glass material.

53. The method of claim 43, wherein the optically transparent component is comprised of silica.

54. The method of claim 43, wherein the optically transparent component is comprised of fused silica.

55. The method of claim 43, wherein the optically transparent component is comprised of quartz glass.